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## SPONTANEOUS CONSTRUCTIONS AND PRIMITIVE ACTIVITIES OF CHILDREN ANALOGOUS TO THOSE OF PRIMITIVE MAN<sup>1</sup>

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Much has been said of late years about following the child's native interests and instincts in directing its education. But if we ask just what these interests and instincts are the answer is not so readily given. A different answer would very probably be given by different leaders in this field. Children grow up in an environment adjusted largely to adult life and adult ideals, and are still pretty firmly in the grip of the traditional school system. Therefore their spontaneous activities are still more or less obscured and neglected. But it is just here that most may be learned about children's instincts and interests. These are nowhere more fully revealed than in their spontaneous activities, plays and constructions. It is here that they get away from the influence of adult life and complex society at least partially, and build up their simple crude world with all its primitive aspects and attributes. They thus give expression to their mental and physical capacities and needs. These activities of children have not received the attention which they merit, although considerable valuable work of this kind has already been done. The pity is that what we do know in this field as a result of previous study is not more fully applied. The student of child study who is familiar with the material that has been collected in the past two decades on this subject cannot but be impressed with the great difference which exists between the theory of education which this child study investigation suggests on the one hand and the theory which under-

<sup>1</sup> Acknowledgments for returns are due to Miss Lillie A. Williams, New Jersey State Normal School; Mr. W. S. Munroe, of the Westfield, Mass., Normal School; Miss Frances Judson, of the Chicago Kindergarten Institute, and Margaret Pritchard, of the Philadelphia Normal School for Girls.

The writer is indebted to Pres. G. Stanley Hall for the preparation of the questionnaire and the collection of the returns; for the use of his lectures on man's psychic evolution; and for his many suggestions and inspirations in the preparation of this paper. He is also indebted to various correspondents of Dr. Hall, whose names to our regret have been mislaid and cannot be given in full here, for ideas on the primitive steps in man's evolution touching his early use of the string, point, edge and the evolution of striking and throwing.

lies much of the actual school work on the other. It is quite evident that there are many instincts and interests of children already revealed by these investigations which are not taken account of and utilized by the school programme of to-day.

The following investigation of children's spontaneous constructions and primitive activities is made in the hope that something of value may be added to the large mass of data already collected on this subject and that a clearer, saner insight into the child's nature and needs may follow.

The minute details of the investigation are given so that the picture of the children's activities may be as complete as possible. No effort is made to interpret all these facts, a statement of the facts being thought worth while.

Some attention is also given to the analogy between the children's activities and constructions and those of primitive man with the view of throwing some light on the possible origin of these activities and constructions of children. It is very improbable that the child begins life with a clean slate, so to speak, and that imitation and experience account solely for his early activities. Even the idea of Groos that children are somehow preparing for their later life work seems hardly tenable, except in so far as it is incidentally the case. Investigators are coming to recognize a psychic evolution as well as a physical one. From this point of view the mental life of man cannot be adequately understood except by a consideration of its phylogenetic origin. The child's mental and physical life according to this view, is largely a budding forth of the early, vital, racial experiences. That is, in the evolution of the race its reactions towards its environment became a part of the vital inheritance of the generations following. The part which the unconscious psychic influence played in this evolution is now thought to be far greater than was ever heretofore thought to be the case. How far this is true and what part is played by imitation and the experience of the individual cannot of course be stated. But when children seize upon a certain line of activity with enthusiasm, and delight and persist in it for more or less extended periods of time, there is certainly more at the basis of this phenomenon than mere imitation. For frequently they give expression to unique and original ideas. Again, when these activities are very similar to those which the race very probably experienced in its early history, we are certainly justified in giving some consideration to their phylogenetic origin.

The significance of this view, if true, for purposes of education can hardly be overestimated. It thus becomes the imperative duty of educators to follow this course of development and work with the current of psychic evolution and not against it as is so often the case at present.

In order to compare children's activities more readily with those of the race this investigation was made along the lines of their spontaneous constructions and play with blocks, stones, sand and earth, and snow; their use of strings, points and edges, and their striking and throwing propensities were also considered. Their attitude towards clothing and their desire to modify their bodily form also received attention. The material was largely gathered from the returns of a questionnaire which was answered by the students of several normal schools. Thus the returns have the merit of coming from teachers or persons expecting to become teachers and actively engaged in preparation for their work. Those who had the questionnaire in charge in these schools were trained in collecting data by this means. This greatly increases the value of the material thus gathered.

#### BLOCKS

The reports, covering observations of 186 boys and 269 girls, show that the tendency on the part of children to use blocks for purposes of construction is very marked. It begins even before the third year and continues up through the seventh year. There is great satisfaction in this and hours are often spent in constructing a great variety of things. The material used indicates that if they have not one thing with which to build they will use any other which lends itself to their purposes. This is shown by the fact that when blocks were not available they used bricks, dominoes, spools, corn cobs, pine cones, sticks of wood, boards and blocks from the builder's discarded pile. The usual construction is a house, this being mentioned in the majority of cases. What does it take to satisfy the child's idea of a house? Very young children are satisfied with a solid mass of blocks with no definite form. Somewhat later blocks are placed in two rows with a space between and another row of blocks on top for a roof; or a board may be used for a roof. Many varieties of this are built due to the difference in age and ingenuity of the children. Some omit blocks in the building for doors and windows, and put steps before the door, lay walks leading from the house and may even put a block before the opening supposed to be the door in such a way as to show the door ajar. Others make simply rectangular hollow forms with no provision for either doors or windows. Again others build two or even three stories, with pasteboard or something of the kind for floors, and partitions of blocks between the rooms. These various rooms are often appropriately furnished blocks representing the various articles of furniture. Many children centre upon some one part of a house or other building as for example a fireplace, chimney, stair steps, post-office boxes, pew and altar or church steeple, etc., and omit all

else without any feeling of incompleteness whatever. On the other hand not a few children of similar age go far towards completing the whole surroundings; not only representing all parts of the house in a rude way, including bay windows, piazzas, and perhaps a tower, but even completing the yard with fence around it and gate leading to the road. This gate is frequently rather elaborate with two blocks for posts and another on top of these; or else an arch is built over the gateway. Some extend this so as to represent a whole farm, or even a rural community, or village. The farm includes usually a barn with stable and horses in it, henhouse, pigpen, fences, fields, with cows in some of them. The village consists of store, postoffice, church, shops and streets.

Several interesting things are revealed by this building. In the first place the vagueness of children's ideas is beautifully shown here. They have the crudest notions of even the most familiar objects. Of course some allowance must be made for their inability to execute and embody their ideas in objective form. But their incomplete notion of objects is shown by the fact that they often emphasize one or the other part of an object to the exclusion of other perhaps more important parts, and still consider it complete; for example, the chimney, stair steps, or steeple is called a house or church; a well may be built on top of the ground with blocks and offer no difficulty whatever.

Children rarely undertake to produce a copy of their own house or other buildings with which they are familiar. Only a very few cases are reported in which this was attempted. The children seem to have vague conceptions of their own, the expression of which is more satisfying to them than the making of a copy of one they are acquainted with. The house which they build is sometimes called a mansion, or castle, of which they have heard some story or fairy tale. It may be one which they are going to have when they grow up. It thus seems that the child can more readily represent a type of any familiar object than he can produce a copy of it.

Other forms of construction are towers, pyramids, columns, and steeples. These were mentioned in about 75 per cent. of the reports. The chief aim is to build them as high as possible, the higher the more delighted is the builder. The blocks are either all used in this building or else piled up until the tower falls. The falling of the tower is enjoyed very much and often it is pushed over with great pleasure. These towers are built in various ways; sometimes two blocks are set upright and a third placed across the top, and others placed similarly on top of these. Others pile them in rectangular columns with square bases or in the form of a pyramid. The steeple of the church

is usually the principal part of the building, and is built high as possible. It is quite evident from the returns that children derive especial satisfaction from placing the blocks one upon the other. This seems to be one of the first uses which they learn to make of them, and is continued through the block-building period. Another interesting exercise is to place dominoes or other similar blocks in such position that when one is pushed over it pushes over the one next to it and so on until all are down. These rows are often made as crooked as possible to still accomplish the end desired. The child seems to learn for the first time that it has the power to arrange blocks so that the result will be greater and farther reaching than is ordinarily the case. It learns to extend its power of doing things in a new and, to it, surprising way. This is also done in piling up the blocks and having them fall.

Other things which are built are walls enclosing space which may be called a sheepfold for protection against wolves. Or they may be protection against enemies of the children, or prisons. They are varied in shape, often circular or some other odd form. Children also build engines, cars, bridges, smokestack, blacksmith shop, boat, Noah's ark, fountain, mountain, fire engine, park, etc.

The important fact here is not their success or failure in attempting any of these things; but rather that they would undertake to represent such varied and often complex things. The interest which children manifest in this construction play could certainly be turned to great advantage in their physical and mental development, if properly utilized. Both the home and the kindergarten and even the lower grades could do much more than is done in providing for and encouraging this interest. The possibilities here have not yet been fully developed. If the blocks were made somewhat larger than is ordinarily the case and of heavier material, the child would get excellent exercise in making these constructions. The effort of the child to put into objective form his ideas is certainly stimulating in the highest degree, and its encouragement would do more for the child than much of the more abstract work that is being done in the schools of to-day. The study by the teacher of these crude efforts of the child would be a very profitable thing. In no other possible way can one get a better notion of the child's limitations and difficulties than by a sympathetic study of these early constructions.

#### SAND AND EARTH

Just what do children construct with sand and earth and how do they play with it? The returns fully agree with common observation in that they show that children like very much to

play with sand and earth. Here also a great variety of constructions are attempted, and as children continue their interest in this sort of construction to a much later period than with blocks they produce much more elaborate and complex structures. Perhaps the most favored effort of the children is that of well-digging. Both boys and girls enjoy it. Here, as elsewhere, the age and natural aptitude of the children determine the nature of the product. The younger children merely dig holes in the ground and fill them with water. When a little older they often dig a deep, wide hole wall it up with boards or even with stones and make it have more the appearance of a real well. Some of the older children even struck water and made a real well. Two boys 10 and 11 dug a well 6 feet deep and walled it up.

Some children like to dig holes into the ground without any definite purpose. These are of various sizes and depth and are often called a lake or pit. A favorite effort is to dig tunnels between two holes. The digging of underground passages seems to have a peculiar fascination for children. Canals and ditches to conduct water are also interesting to them.

The greatest delight, especially for the boys, is digging caves. There seems to be a peculiar interest in digging a hole big enough to contain three or four boys, and then covering it up and concealing it so that no one can find it but the ones who dug it. Here much time is spent in hiding from people, eating fruit and other food pilfered from the pantry, etc. Girls rarely participate in this and when they do they assist their brothers and do not take the initiative. The ages of both boys and girls range from 7 to 15 years. The greater number are from 11 to 15. These caves vary in complexity from mere holes in the bank or ground to large sheltered rooms connecting with each other by passageways. Several illustrations may make clear their plans.

"Three boys, 10 to 11 years, dug cave in hillside. Covered floor with pine needles, hung burlap across doorway and lighted it with tallow candles. Here potatoes were roasted and eaten, and hours spent every day." "M— 14, and others, dug cave in river bank, had stove and furniture in it; also fishing tackle, boat and oars. Kept it in good shape. Stole watermelons, apples and chickens of neighborhood and ate them." The work that is often done in constructing these caves is almost incredible for boys of this age. Just recently the writer has had an excellent opportunity to observe a case of digging and building such a cave house. A boy of 12 and his 10-year-old sister conceived the idea of digging out the central portion of a mound about six or seven feet high and eighteen or twenty feet in diameter, and then constructing a house of this by placing

board walls on the sides and erecting a roof over the top. They also made arrangements for a chimney and for at least two rooms, and fully expected to sleep in it at night. Although the boy is regarded even by his father as having an aversion to work of any kind, he went to work with such enthusiasm that the digging was completed in a few days. Several tons of earth were removed and part of it wheeled some distance from where it was dug. His sister also worked at it, and he pressed as many of his companions into the service as he could but, nevertheless, the bulk of the work was done by the boy. He persisted from day to day until the digging was completed. His plans are elaborate and the problems which he will have to solve before completing it will be many and complex.

It is very evident that the interest in these semi-cave-houses leads boys to do a great amount of labor, planning and devising. The educational value of this is by no means unimportant. It brings them face to face with practical difficulties and problems and gives them a chance to use their inventive genius. From this point of view what might ordinarily seem to be sheer nonsense and a waste of time and energy becomes a means of development that can hardly be equalled in any other way. These activities should therefore receive the most careful consideration by adults. Here, as elsewhere, the great gap between youth and maturity must constantly be kept in mind if the right attitude is to be maintained towards these activities of children and youth.

The house-building propensities of children with blocks and then a little later by digging into the earth, and also into the snow, as will be seen later in this paper, indicates pretty clearly a deep-seated basis for these constructions. Imitation seems hardly sufficient to account for them; for many of the structures are widely different from any which the children have seen. It might be argued that since children are immature both physically and mentally we should expect them to build just such structures as they construct and as savages might build. But this fails to account for the universal and intense interest in this form of activity. We are almost forced to conclude that it is the expression of the psychic tendency formed not only in early man but in many of the higher animals to build some sort of habitation.

Another prominent interest of children is shown in their desire to bury things. Nearly all the children mentioned in the returns were at some time much interested in this. Among the objects buried were broken dolls, birds, chickens, cats, dogs, mice, grasshoppers, marbles, knives, books. In most of these cases the burial is for the purpose of disposing of the dead body of the animal. The burials are generally conducted

in groups and with more or less ceremony. Flowers are in evidence and the mourners make their demonstrations with some real feeling. The body is wrapped in some kind of cloth, placed in a small box and then lowered into the grave and covered. For days and even weeks afterwards the grave is visited and sometimes flowers placed upon it. Sometimes the grave is reopened and an inspection is made of the body. Children here become acquainted with the mystery of death in a way that may prepare them for the ordeal of burying some one of those nearest them later.

Some children seem to enjoy burying anything, such as knives, forks, spoons, pins, thimbles, spools. Several from 3 to 5 years of age buried playthings or pennies, expecting them to grow. Others buried marbles, toys, books, to keep them. One girl of 4, planted a ring expecting it to grow into a large ring.

Children also like to partially bury themselves or others in the sand. Usually the whole body is covered except the head, but sometimes only the hands and feet are buried.

The other objects made with sand and mud are many and varied. Chief among these are mud pies, cakes, houses, mounds, forts, walks, bridges, dams, animals, people, dishes, farms, villages. The making of mud pies and cakes seems to be limited largely to the girls. The returns show that 158 girls made these but only 4 boys. Houses are built by both boys and girls. They consist of various degrees of complexity from mere heaps of sand with small holes for windows and doors to houses with several rooms, yard with fence around it, flower beds, paths, driveways, barn, pigpen, well, trees or small twigs, even communities and villages are attempted. These are of course miniature in size. Some make an Eskimo house by burying one hand under a heap of sand, packing it tightly and then gently removing the hand.

Mounds are made by piling the sand several feet high. Sometimes they are tunneled through. Forts and walls of various sizes are also built. Animal and human forms are attempted in sand and mud. These are of all degrees of perfection from the rudest representation up to full figures with arms, legs, features. Since these same things are done by children with snow, a more complete discussion will be given under that subject.

#### STONES

The data on stones is treated under the following heads: Things made of stones; collections of stones; charms and amulets; breaking and chipping stones, pounding stones together and using them as hammers; stones set on edge or

superposed. Each of these will be discussed in the order given.

It is evident that stones enter largely into the play of children. In nearly all the returns, including 281 girls and 101 boys from 5 to 9 years of age, were found statements such as these, "I liked to play with stones in my childhood." "I played much with stones." There were reported more than thirty different uses made of stones. Their use in making playhouses was most prominent, it being mentioned in one hundred and twenty-two reports. The houses are very simply represented and usually consist of only one or two rooms; but in a few cases four or five rooms were mentioned. The walls are merely rows of stones on the ground with blank spaces for doors and windows, and single rows of stones to represent the rooms. In only four per cent. of the cases were the stones superposed and an effort made to enclose the rooms on all sides and construct a roof. Thus we see again that the child's conception of a house is not very clear and is easily satisfied. This will be illustrated again in the other parts of this paper. A few quotations will show what was done:

F., at 7. "Made outline of house with stones, leaving space for door and windows, and left stone to knock on when any one wanted to come in."

F., at 6. "Marked off the extent of my playhouse with stones placed end to end."

F., at 8. "Marked off playhouse with white stones, also rooms."

The houses were rarely large enough for the children to enter them. The merest hint of walls and rooms was entirely satisfactory for a complete house. Two sides and one end often sufficed for a house. In fifteen cases mention is made of dividing lines or partition walls within the houses to separate rooms. One girl reports that she built a playhouse with walls four layers wide and two feet high and representing a real house in number of rooms. Four houses were built like caves and were called cave houses. One boy said, "I made a cave house out of stones and some boys claimed it as theirs and I had to drive them out." Whenever a house was large enough they would always crawl into it, as is shown by the following typical case: "Built playhouse which was simply stone walls with cornstalks for roof into which we often crawled."

The houses were supplied with furniture and kitchen utensils in 44 cases. Smooth, flat stones were used as tables and chairs for tea parties. Various shaped stones and granite chips were used for dishes. Beds for dolls were made of stones in one corner of the room. Ovens and furnaces were mentioned several times. They were built by placing flat stones on bot-

tom, and placing others on the sides and then placing a flat stone on top.

The next most frequent use that was made of stones was playing store or some other form of interchange. Stones were used as articles of food or merchandise in 45 cases and as money in 42 cases. When used as articles of food they were marked in some way or else different shapes were the distinguishing marks. When used as money the distinction depended upon the size or color of the stones. Stones represented all kinds of groceries such as eggs, nutmegs, lump sugar, apples, potatoes, raisins on cake, candy, various kinds of cakes, etc. In 2 cases scales were mentioned in connection with store play. These consisted of boards balanced on a rock.

Bright, sparkling stones were used as decorations for the rooms. Some decorations were made by pressing stones into the sand so as to make pictures of animal forms or human faces. In 43 cases stones were used to form the border of flower beds, walks and roads. The stones so used were carefully selected and arranged with an effort to make a beautiful effect.

In thirty cases gardens were made in connection with the house by laying rows of stones around a plot of ground or setting them upright so as to make a fence or wall. 75 children used stones as a means of separating different tracts of land from each other. A frequent expression was "Marked off extent of homes and gardens in play so claims would not overlap and cause trouble." Only eight children constructed barns in addition to their houses and in no case was a barn built without a house. The dawning of child consciousness is nowhere more fully revealed than in these early constructions of children, and for this reason the details have been so minutely given.

The use of stones in damming up streams was mentioned in the play of 29 children. This was done either to make a lake or to make a waterfall or rapids; this seems to have been a habit with some immediately after a rain in the spring and early summer. The making of bridges was mentioned 9 times and the making of canals and dykes once. The bridges were formed by throwing stones into the water until they extended above its surface. One little girl built an arch across a small stream by setting stones on end and leaning them against each other and then piling others on top of them.

The graves of dead pets such as cats, chickens, birds, dogs, etc., were marked with stones by fifteen children. The following are typical statements: "Placed stone at grave of canary." "Got chips from the marble cutters and used them as grave stones for bird and cat." The ceremony accompanying these burials and the erection of the tombstones was more

or less elaborate and in a few cases the initials of the pet's name were scratched or written on the stone.

Sixteen references were made to the use of stones for marking or writing with or upon. The scratching of pictures on sandstone was very much enjoyed. An old piece of slate found in the creek bed was often carefully saved and used in writing in preference to a well sharpened pencil. Colored stones that mark were valued highly and placed in the collection of valuable stones. These stones were used to mark on fences, rocks, or any other place that would receive the marks which were usually the child's own name or initials. Several children wrote their initials on stones and threw them away. This strange desire to write their names in as many places as possible seems to persist through the adolescent years.

Other uses of stones by one or more children were as follows: Six mentioned the use of stones to represent families; father was large stone, mother smaller one and children still smaller ones. Six children played guessing or other games with stones. Some awarded stones as prizes for good conduct; others rolled stones off of a ledge or down a plain; put them in tin cans and rattled them in giving the Indian war dance; fastened a stone to a handle and made a tomahawk; buried stones; used them as jewels; as a throne for a king; as means of representing trees and other plants; arranged them in concentric circles, squares and triangles; used sharp stone to cut down a cherry tree; used stones to scatter along a path so as to tell the way to return; or one would scatter stones and another would try to track her by them; and one little girl placed a stone beside a tree and went to it from day to day to see how fast it would grow.

#### COLLECTIONS OF STONES

This properly comes under children's collective instinct and as this has already been treated by Mrs. C. F. Burk, it will merely be touched upon here. Mrs. Burk has shown that among the things collected by the 1,200 and more children upon whom she reported, stones were collected by 18% of the boys and 15% of the girls. In the returns which the writer has examined over 50% of the children made stone collections; 175 girls and 46 boys. The chief points of attraction were color, shape, smoothness, brilliancy and beauty. Under shape the attributes mentioned most were smooth, flat, round. Under color, white, pink bright, brilliant, red, dark blue, yellow, sparkling, stained; those with holes in them were also attractive. 144 children collected stones on the account of color, 48 because of odd shapes, 38 because they were pretty, 24 because they were smooth, 10 because they were flat and 12 because

they were round. A few quotations follow: F., at 6. "Collected all the pretty stones I could find, liked round ones." F., at 7. "Picked bright stones and hid them for my own." M.,—"Collected stones and arranged them in concentric circles." M., 10. "Collected Indian arrow heads and other strange stones." M., 8. "Collected stones for beauty or with crystals in them." F., 8. "Collected stones of peculiar shape and color to decorate flower beds." F., 6. "Collected stones which would make marks, especially those which would make red or blue lines." F. "Collected stones after rain; liked smooth, round, black, and white ones." M., at 9. "Had great liking for little stones and pebbles of peculiar shape and color, kept them in pocket or hid them; finally I lost interest in them and threw them away." F. "Collected those with holes in them, put on string and wore as bracelet."

One teacher tells of taking 25 children to the seashore. All, at once, began to collect stones of various colors and shapes. The boys put them in their pockets until they bulged out. In nearly all cases the stones appealed almost exclusively to the sense of sight of the children, as is shown by the expressions used in characterizing the stones selected; such as strange, curious, odd shaped, smooth, flat, bright, pretty, sparkling, brilliant, glittering red, yellow, pink, white, and stained. In a few instances the appeal to the sense of touch was mentioned; as for instance M., "I like to carry a stone in my pocket because I like the feeling of it." Again the appeal to the æsthetic in the child was prominent. The use of the stones as decorations of the playhouses, gardens and flower beds was frequently mentioned; also their use in personal adornment, as in making bracelets. They were also placed away on shelves or kept in boxes where they would be looked at and admired frequently. All this shows the groping of the child's undeveloped instinct for the beautiful.

The use of stones for charms or for luck was also a motive in the collection of stones. 59 girls and 5 boys collected stones with special charms. The supposed influence of the stone would keep them from harm, help gain some desired end, or insure some unlooked for good luck. The lucky stone had some distinguishing mark of color, form or size. In about 20% of the cases the stones were described as either white, or smooth white. Other marks were a white ring or a black ring around the stone, black stone with band of gray about it, stone with letter on it, stone with hole in it, smooth stone, stone with brownish color, or red stone. The specific purpose of carrying or possessing these stones will be better understood by giving a few of the more common quotations: F., at 8. "Wore stone with hole in it around my neck for good luck." F.

"Carried red pebble in pocket for months, believing it would bring good luck." F. "Yellow stones were used as charms or as lucky stones, if we lost one the day we found it bad luck followed." F. "Stone with white ring about it had charm; I buried it, said luck three times, and made a wish." F. "Little white stones had charm to keep off warts from my hands." F., 8. "Smooth brown stone is lucky stone; carried it a certain time and then threw it over left shoulder, not seeing where it went."

These illustrations show how strikingly similar the child's acts are to those of man everywhere in the early stages of civilization. Mrs. Burk has shown that the instinct for collection has a rise, growth and decline. Ellis thinks the collecting instinct a survival of fetishism, which in turn is a form of savage worship. Children are imaginative and have little experience to base their theory of things upon. They see phenomena every day which they can't account for. They feel the wind blow, but they know not "Whence it cometh or whither it goeth." Their curiosity is aroused a thousand times and left unsatisfied. They see forces outside of themselves which they cannot understand. Animism, therefore, is as easy for them as for savage man. Thus their minds afford a rich soil for suggestions of all kinds touching charms, lucky stones, amulets and fetiches concerning which the very atmosphere even to-day is still overcharged. This very suggestiveness and ready imitation may signify a racial instinct and have its roots way back in man's primitive life.

The use of stones for hammers was mentioned by 47 individuals, 25 girls and 22 boys. The chief uses to which these hammers were applied were to crack nuts, to crush things with, to make sparks fly by hammering stones together, to pound things into the ground, and to make noise by knocking stones together in order to call playmates.

Stones were broken, chipped or hammered into powder by 87 children. They liked to crumble soft stones to make powder for mud or medicine or to mix with water and make paint. Stones were chipped to see what was inside, especially to see where crystal, mica, quartz or color came from; or were broken for decorations. Again others said they liked to break stones but they could n't tell why. Some of the more common expressions given were: M. "Pounded up soft stone to make mud." M., 8. "Sandstone was ground up for medicine or sugar; also broke stone with mica in it to get it out." F. "Gathered different colored stones, pounded them into powder and put into bottle in layers." F. "Liked to break and chip stones and pound them into powder, mix with water and mould into little balls and dry in the sun." F., 7. "Liked to crack stones to see

what was in them." F., 8. "Broke stones and chipped them, liked the smell, it was a powdery smell." F., 6. "Broke prettiest with hatchet to see where color came from, also tried to break flint to see where fire came from." F. "I liked to strike stones to see sparks fly." 18 children set stones on edge. The following quotations will show why. M., 2. "Stands rocks on edge and screams with delight." M., 7. "Stands stones on edge for wall." M., 5. "Stands stones on edge and knocks them down as enemies." These are typical.

Stones have played a large part in the story of human evolution. Perhaps more than will ever actually be understood and appreciated; and indeed more than had been thought to be the case until archaeologists in recent years began to dig up, classify and study the products of the first steps of civilization. These investigations are revealing a richness of material that bids fair to unlock many of the mysteries of man's early advance in his conquest of, and triumph over, his environment. They show that stones of various kinds were the one great means by which man succeeded in making an advance over his four-footed brethren. Rude implements and tools of all kinds show that the first evidences we have of past history reveal a state of civilization already pretty complex. The ages that elapsed before man was able to modify stones and adapt them to his use, as shown by archaeological excavations, must have been of great length. Of course these must always be a closed book except in so far as their nature is revealed by various tribes of to-day occupying the same stage of civilization. Yet this age, of which there is absolutely no vestige of record remaining, was the real beginning of man's upward movement. Here man began as the only tool using animal and this was what helped him in his contest for supremacy with man and beast. These earliest tools were stones. Perhaps he first found a sharp stone and used it and ultimately tried to improve it; and so came the great number of primitive tools such as chisels, arrow heads, scrapers, saws, hammers, etc. Thus was begun the stone age in the dark and distant past. Stones were the weapons of offense and defence; the fierce struggles that were waged against man and beast were won by the use of superior implements of warfare made of stone. Those who could make the sharpest instruments and could use them most skillfully survived. In short their whole life was centred around stones, and progress was made possible by their use.

In historic times stones played a large part especially in the early life of the people of Europe and Asia. Among the Hebrews the stones were regarded as instruments of death. Precious stones were often mentioned as symbols of divine glory. The ceremonial use of stone and flint has been prominent in

all ages. As an appeal to the sense of beauty stones have had a great effect throughout history and even to-day man's most precious ornament is a stone. Since stones have played such an important part in man's evolution it is not strange that they should make a strong appeal to children and enter so prominently into their play. It is another illustration of the psychic adaptation of the race to its environment in its evolutional struggle. It seems but wise to use and direct this interest and give it full and free play. The child may thus become acquainted with the facts that will later help him interpret the composition of the earth's surface; but what is better he will be stimulated through this activity to healthful, physical and mental life. In building with them he will need to plan and think and then execute. Even if the stones are rough, and he bruises his hands a little now and then, this will not be amiss in his contact with the larger life that awaits him. Similarly all other activities of children in connection with stones mentioned above are healthful and might well be encouraged.

#### SNOW

Snow has ever been the delight of childhood. The dreariness of the late autumn months is made more endurable because of its prophecy of the cover of whiteness that will soon spread over the landscape and hide the dreariness from view. And then a thrill of delight fills the youthful heart as the first flakes begin to fall, "And driving o'er the fields seem nowhere to alight." No more study and work now until the pent up enthusiasm is spent in happy glee and play out in the midst of the "Swarm and whirl dance of the blinding storm as zigzag wavering to and fro crossed and recrossed the winged snow." Then the wading through the drifts, the digging through the "solid whiteness;" and finally when the warm south winds change the dry, light snow into the moist, plastic moulding material, the snowballing, the making of human forms and the playing of games—all add to make snow truly a joy of childhood. Especially on days when snow is falling are children stimulated to a higher pitch of activity and enthusiasm. They become more spontaneous and unrestrained in their play. There is new vigor and life pulsating throughout their bodies and they abandon themselves to the impulses of the moment more than at other times. This is shown by the following quotations:

F., 20. "I was always happy when I saw it begin snowing and when I could run and play in the snow."

F., 19. "We children used to love to jump into the deep snow from a wall. We would bury each other in the snow with laughter and shouting."

F., 22. "I liked to play in snow. I helped my brother dig

caves in big drifts, packed snow together for forts and made hills, working for hours for one or two slides down it later."

F., 20. "Whenever it snowed we built a fort and had a snow fight. I remember doing this from the time I was six. We made men and animals and played circus."

F., 20. "Threw snow by the handful into people's faces and tried to wash them. Made snow men and then run and jumped on top of them and tumbled them down."

This overflow of life is probably due to the brightness of the snow. In the article on "Reactions to Light and Darkness," by Drs. Hall and Smith, it has been found that there is a close connection between the general feeling tone and the amount of direct sunlight. The bright effect of the white snow no doubt has a tendency similar to direct sunlight.

The returns covered 411 observations of children, and reminiscences. Of this total number 159 were boys and 252 were girls. These children were somewhat older than those playing with blocks, ranging from 6 to 12 years of age, and worked more in groups than in playing with blocks. There was a marked tendency to make constructions and mould forms of various kinds. Under certain conditions snow is especially adapted to this use. It packs easily under pressure, and yet it can be changed in form with little effort. With the child's instinct for constructing things it is not strange, therefore, that snow should be made use of for this purpose.

Nowhere, perhaps, do we have a better opportunity to study the child's crude imagination and primitive constructive power than in the snow constructions. This is especially true with regard to his efforts to mould the human form into the so-called snow man that is so frequently made. Of the total number of children reported 319, or more than 75%, attempted the construction of snow men. Like primitive man, the child is easily satisfied with his product, be it ever so rude and imperfect. The snow men were more or less alike. They usually consisted of three balls of varying dimensions piled one above the other and shaped where they joined. The lowest ball was always much the largest with the smallest on top forming the head. The height of the whole was determined by the age and height of the children. The tendency was to make the figure as high as they could reach. The arms were frequently omitted, and not very successfully done when attempted, and the fingers were not indicated. The parts of the body that received most attention were the face and the upper part of the trunk; but nearly all the effort was centred upon the face, as will be shown by the following typical quotation: M. and others. "Made snow man by rolling three balls. Punched holes for eyes, nose and mouth."

M. and F. "Made snow man; used bits of coal for eyes, stones for nose and mouth, and broom for musket."

F., 5. "Made snow man by rolling snow balls and placing one on top of the other; used coal for eyes, nose and mouth and row of buttons down in front."

M. and F. "Made snow man; used stones for eyes, used stick for nose, drew ears and mouth with pointed stick, placed clay pipe in his mouth and hat on his head."

M. and F. "Made a snow man by rolling long balls for arms and legs, used coal for eyes and small ball of snow for nose, also for ears, made long line for mouth, put a stick in it for a pipe, laid stick on shoulder for gun."

M. and F., 10. "Made snow man with marbles for eyes, hay for whiskers, excelsior for hair, and a piece of red flannel cloth for a mouth." The eyes received more attention than any of the other features. While all of the children did not go into details concerning their snow men, 52 mentioned the eyes especially and made great effort to represent them with effect. The usual representations of the eyes were stones, marbles, pieces of coal and short sticks. The mouth seems to have been second in the attention it received; it was mentioned 50 times and was usually made of sticks or just a mark in the snow or a row of cranberries or red cloth. The nose was mentioned less frequently and the ears a very few times only. It may be due to the fact that the ears are less easily represented. Very few attempts were made to represent the legs of the snow men and in all cases these were made by the older children from 10 years up. The younger children were satisfied with a large ball as a foundation upon which to construct the remainder of the form. It would thus seem that they centred their attention upon a few of the more important portions of the human form to the neglect of the others. Only three attempts were made to make snow women. One of these, a girl of 7, rolled large balls of snow and made a woman by shaping the bottom ball like a skirt and made her with her arms crossed, which must have embodied her idea of woman's characteristic position. It is not clear why they gave so little attention to the making of feminine forms.

Perhaps it was due to the fact that the boys took the initiative in the constructions. There is some evidence of this as the girls frequently stated that they helped their brothers. But the more probable reason is that man's more active, out of door life appeals more strongly to the children's imaginations.

The attention to the dress of the forms made reveals the crude conceptions which children have concerning the representation of clothing. Thirty-six children represented the

coat with a row of pieces of coal down the front for buttons. Six placed a hat on the head with no other effort to represent clothing while the rest made no effort whatever to indicate clothing. There was considerable effort to put content into the forms and express ideas with them. Father and son were represented by tall and short forms. Some children made whole families—the father, mother and children; put a pipe in the father's mouth to distinguish him, and a broom into the mother's hand to distinguish her while the children were made smaller and of different sizes. Soldiers were indicated by placing long sticks on their shoulders for muskets. They were usually stationed near a fort to guard it. Various characters such as old King Cole, Santa Claus, and others were given some distinguishing mark.

The tendency to make caricatures was noticeable. Some were dressed up like scarecrows, others had long sticks in their mouths for cigars or pipes, and again others had old hats and in one case a dented derby in such a way that it expressed their sense of the ludicrous. Several different attitudes were manifested toward these creations of their imagination. Some called it their teacher and snowballed it. Others fixed it all up with hat, broom, pipe in mouth, and then were afraid of it at night. Again others used the snow figure as a target and shouted with delight when the nose, arm or head was knocked off. One boy is quoted as saying that he was sorry when it melted and left nothing but a puddle of water.

Some of the children made their own forms in the snow by lying down flat and placing their arms out straight. They took great delight in seeing their own forms in this way, as the following quotations will show: F., 8. "Made a picture of myself by lying backwards in the snow." M., 8, lay down in snow to make his print in snow. This effort to see their own form probably arises from a desire to get better acquainted with themselves. Angels were also made by lying in the snow and moving arms and hands up and down in the snow to make wings. Whole rows of these were made side by side. Others made like figures and called them butterflies. Again others made forms of cats, dogs, bears, lions, tigers; drew pictures with stick, and wrote names.

The data do not permit an accurate treatment of the ages of these children but the extreme limits are pretty clearly marked. Of those children whose ages were indicated none were below 5 and none above 13 who participated in making snow men. Of the 82 whose ages were given 6 were 5 years old, 12 were 6 years old, 16 were 7 years of age, 14 were 8, 7 were 9 years old, 12 10 years, 7 were 11 years, 8 were 12 years. It would have been a very interesting thing if the data had been given

to study the development of this tendency to make human forms and its decline. The fact that none of these children whose ages were given continued the making of snow men beyond their 13th year would seem to indicate that this must be near the decline of this form of expression. Indeed it is not surprising that this should be the time when they lose interest in this form of self expression since this is the period of change to larger life and interests. Reason is also more fully developed and children live less in the imagination. This is also the beginning of the awkward age when children have less confidence in themselves and more hesitation in expressing themselves in any form. They are more able to judge between what they actually do and what they attempt in way of self expression.

As has been stated before we have here a photograph of the children's minds such as can be gotten in few other ways. The pedagogical hints and suggestions to be derived from this study touch some of the most vital questions in education to-day. The satisfaction which the child gets from these crude expressions of his ideas emphasizes the fact that he has a craving to express himself, and he should be encouraged to do so. But he must not be required to be too minutely exact and painstaking in his work. The rough outlines satisfy him and are the best his stage will allow him to use.

The general character of the forms made by the children indicates that their early efforts embody types and not copies of real objects or forms. The type does not lead to careful attention to details and so more attention can be given to the main outlines. This needs to be considered in asking young children to draw.

Among primitive people everywhere this expression of types is attempted and the representations have a marked resemblance to those of children.

There is good reason for believing that the child's interest in this form of expression rests upon a strong phyletic background. The earliest records of mankind show that even at that time man had developed a relatively adequate way of representing human and other forms.

The other constructions of snow were numerous and varied, principally forts, houses, caves and large balls. The forts were mainly built of large snow balls piled on top of each other with snow piled up around them. Sometimes they were closed on three sides but more often simply a long, large pile of snow was made for protection in the snow fights. Some made large mounds and dug out the inside and made small windows through which they could watch the enemy. Ninety boys and 79 girls were reported as participating in the construction of

these forts. Besides these many papers mentioned groups of children engaged in these plays. In fact all play of this kind is done by groups of children. The group is the unit in the construction of the forts and in carrying on the contests. The children divide themselves into two groups and each builds a fort and then each tries to destroy that of the other, or to drive them away from it. Sometimes flags are placed on the forts and then the contest is directed toward capturing the flag. There were 67 different descriptions of, and allusions to, these group snow fights. Sometimes there was a captain on each side and definite rules controlling the battle. Sometimes forts were used to hide behind and throw at passers by; again there were a number of descriptions of snowball battles between two individuals at close range and with great vigor. The throwing of snowballs at marks, and without purpose was also often mentioned.

These snow battles and the impulse to throw balls at each other and at passers by indicates a ripeness of the muscles involved in throwing, which are especially the muscles of the shoulder and the upper arm. These snowballs are admirably adapted to give expression to this tendency. They are more or less harmless and yet form excellent missiles. They are sufficiently effective to enable the one or the other of the contestants to triumph by virtue of superior skill and strength and yet not severe enough to do permanent harm. The vigor with which these contests are carried on and their spontaneous nature leave no doubt that they satisfy a deep-seated craving and interest, and are echoes of an age when skill in throwing meant survival. This will be referred to in another connection.

It would be interesting here to see how this tendency on the part of the children is met by the schools. In a number of schools with which the writer is acquainted there is absolute prohibition in the matter of throwing snow balls, or engaging in snow fights of any kind. He has very distinct recollections of one school of 300 pupils in which such a rule was inforced. The falling of snow always brought its troubles, and frequently after the school intermissions the halls of the building reverberated with the reminders that were being applied to the effect that the wicked urchins should not again give expression to this phyletic tendency. Perhaps rightly, too, for the limited area of the playground and the proximity of dwelling houses all around made it rather dangerous to allow the free throwing of snowballs. But this lack of school ground only goes to show that school officials still have the idea that schools exist for the sake of book learning and that the physical part of the child is of secondary importance. The idea that the child must first have a good strong body and that the school should work towards this end has yet not taken firm root.

The snow houses, caves and tunnels were more or less elaborate; 106 descriptions of houses were given and 84 of caves and tunnels. The houses were built by piling up snow and packing it down, digging out the centre of snowdrifts, or by rolling large balls and piling them up. A few quotations follow: M., 10. "Built snow house and put cat in it and closed door for ten minutes." M., 8. "Built snow house which held 5 boys." 4 M's. "Built house by first piling up snow then dug passage through it and then dug out inside; poured water over it to freeze it." M., 4; F., 8. "Built house by digging in deep snow bank, then filled entrance except door, then took carpet, stool and table in and ate inside." M., 9. "Built snow house against fence, could crawl in at one door and out at other; this was pleasant." F. "Built house by digging out room and putting chairs inside, had party inside; did not mind cold for we bundled up." M., 5 and F., 9. "Built snow up 4 feet high, patted it down with shovel dug out inside, sat in it with candle and ate like Eskimos." One thing that interested the children much was to make long tunnels into a snow bank and then dig out a large space in the interior of the bank and crawl back and forth. The opening into the interior must be small so as to be just large enough to crawl in and out. This gave special satisfaction as was also noticed with the cave houses.

One hundred and twenty children liked to roll large balls. A variety of reasons was given for this; some wanted to see how large they could make them, to see how long it would take them to melt, to see who could make the biggest, to roll them down hill, or just because they liked to make them.

It may seem strange to speak of snow as a factor in education and yet the opportunities here are simply unlimited in the northern states where there is a liberal supply. For purposes of construction and moulding there is no better material and it is evident that children enjoy this. If instead of prohibiting the play in snow, as is now so frequently done, children were encouraged to play with it and to construct objects, roll balls, mould figures and have snowball contests, it could be made a valuable help in education.

#### STRINGS

What part do strings play in the early life of children? What string games and plays interest them? Perhaps few persons fully appreciate the large and varied use which children make of them. Of the five hundred children reported upon, not one was there who did not have some interest in strings. The infant of two or three soon learns to tie chairs together, to pull objects attached to strings, or to play horse with strings for lines and harness. At this age the string is

also used to collect buttons and beads, which are used for decorative purposes and fastened to the hair, or worn around the neck, or wrist. As the child grows older these uses are extended in many ways. The material used varies from the common cord to willow bark, corn husks, grasses, leather strings, and rope.

A differentiation in the use of strings soon becomes evident between boys and girls. Although a great many uses are common to both and what one does the other imitates, yet by the time they reach the 9th or 10th year the different interests are pretty clearly marked. Some of the uses common to both are making cat's cradle, see-saw, playing horse, tying strings together, pulling objects with strings, making telephones of strings and cans, and making animal forms. Both boys and girls braid but with different ends in view. The most common mode of weaving is done with the use of a spool and four pins or tacks placed at one end of the spool to which four strings are attached. The strings are then braided or woven with the use of some sort of needle. The most common modes of braiding are also practiced with from three to seven strands. Grass, hay, willow bark, corn husks and silks are used in braiding, besides the common cord. The most frequent use of the braided material is that of lines for playing horse. The girls very frequently use the braids to make circular or other shaped mats. They also braid rags and make rugs of them. Hay, grass, clover stems, or varied colored strings are braided and from these are made necklaces, watch chains, bracelets, or rings; corn husks and silks are braided and used for doll's hair. The boys use the braided cord, grass, straw, leather, or willow bark, for harness, whips, fish nets, swings, to make bows or as belts for machines. Boys have a greater interest in saving string and when they find a cord of any kind it usually finds its way into their pockets. Both boys and girls are interested in knots of various kinds; but here again their interest is different. Boys want to learn to tie hard knots and knots that others cannot undo, such as puzzle knots, sailor knots, slip knots, twists and hitches. Girls, on the other hand, are more interested in knots for decorative purposes. They like to tie many knots or loops of various kinds in a string and hang it about their dress, or they may even have knots take the place of beads around their neck, etc.; or they may knot a hammock for their dolls.

Some of the applications of strings which belong more distinctly to boys are making bows to shoot, sling shots, flying kites, making fish nets, rigging up machinery with strings for belts, devising new puzzles and tricks of various kinds, rolling

strings into balls, and making harness for dogs or goats. The tricks with strings, such as working out puzzles; cutting a double string and apparently chewing the ends together; or tying a string to a button-hole and taking it off without untying it, have a great charm for the boys.

Crocheting, working with the needle, and making ornamental articles such as bows or loops, appeal more especially to girls, according to the returns, as is illustrated by the following:

F. at 11, had fancy for tying bows; fixed odd bows, on back of chair, in my hair, around my waist, and for my dolls.

F., 8, decorated her doll's hats with ribbons, sashes and ties.

F., —, made rope dresses, decorated myself with rope in which were tied knots and loops.

F., 7, braided colored string into bracelets, necklaces, and rings.

At about 6 or 7 the girls use strings to sew dolls' clothes and make play clothes for themselves. Later, at about 10 or 11, the use of the needle appeals strongly to them. The various stitches, such as the cross-stitch, hemstitch, brier-stitch, feather-stitch, knot-stitch, backward stitch, cat-stitch, crow-stitch and button-hole stitch, are learned and new ones invented. Crocheting is also learned with enthusiasm and new patterns are puzzled out and named. Laces of various patterns are made and new ones attempted. This interest in the various lines of crocheting and needlework may grow and continue through life.

There is perhaps no spontaneous interest on the part of the child that is more marked and definite than this string interest. It has not been adequately recognized and made use of in the child's education. Nothing which the child could do would give it a better idea of man's early difficulties in overcoming his environment than this free use of the string. It could also be made an excellent means of introducing the child to many phases of the great modern industrial world. The extended application of the principle of the string underlies much of the progress of civilization. What would be left of our industries or even of our civilization if all applications of the string were never invented? Not only would all textile industries disappear but also all such machinery in which belts and chains are used. The early steps in civilization seem to have depended as much upon its use as those of later times. One need only visit an anthropological museum, such as the Peabody Museum in connection with Harvard University, to be convinced of the great part played by the string in the early struggles of the races. The great degree of perfection of many of these uses of the string found

among primitive people indicates that its use came very early in the evolution of man. "The textile art is older than the human species. For not only spiders and many caterpillars draw out extremely fine threads, but birds wove nests long before the advent of man on earth. . . . There is no reason to doubt that the very first women were weavers of a crude kind, and that textile art has been with us always in one form or another." (The Origin of Invention, O. T. Mason, p. 224, chap. VII.)

Most primitive people use the string in connection with religious rites, ceremonies and magic. Many of our common string games are hoary with age, and were perhaps once connected with magic performances, of various kinds. For example, our common game of cat's cradle is made in some form or other by nearly every primitive tribe of the world to-day; and is also known by most civilized people. It has been found among the people in the following countries: Korea, Japan, East Indian Archipelago, Australia, Africa, western Asia, and among the Eskimo, American Indians in both North and South America, and the people of western Europe. There are 97 varieties of this game known to the world. Some are accompanied by muttering chants or songs. In other cases a consecutive story follows each movement. The same history might probably be worked out for each of our common string games and tricks. "All over the world strings, cords, and knots enter largely into the magical practices." (A. C. Hadden, Introduction to String Figures, p. XXIII.) The fact that primitive people make so much use of the string in all phases of their daily lives, including their religion and magic, gives some idea of the large part which it must have played in their struggles and how much they valued it. It undoubtedly became of survival value to many primitive tribes.

The analogy between children's uses of strings and those of primitive man is thus seen to be very close. Undoubtedly many of the uses which children make of them to-day are given us by social inheritance as is generally maintained. But the aptitude which children show in their use and the intense interest with which they play with them, and even save them, point to something more than mere imitation. It has been said that the younger the child is the racially older it is. If this be true it can readily be conceived how the early struggles of the race with the string as a means of evolution, could give to the modern child's mind a psychic stringward tendency. From this point of view it becomes all the more necessary to utilize this racial instinct in the early education of the child.

## POINTS AND EDGES

The first fact which the returns reveal is that girls are much less instructed in the point and edge as a means of sticking and cutting than the boys. Of the 384 children reported upon, almost three-fourth are boys. The knife leads in interest, nearly every boy being keenly anxious to own a knife of some description. If unable to own one he gets much satisfaction in using some one else's. The interest begins to manifest itself at about 5 years, and grows to about from 12 or 15, when it is at its height. Considerable sacrifice is sometimes made by the boys in order to purchase a knife. Several instances were given in which boys worked for several days for a knife or deprived themselves of other things to buy one. Some spent all their money for knives owning as high as five or six at one time. Their interest centres in the number and sharpness of the blades. Each boy's knife must be sharper than those of others, and comparison of knives with respect to sharpness is common. The blades are tested by cutting into hard material, by seeing which can cut the largest shavings or chips from wood, or by trying to cut paper or a hair. This leads to sharpening the blades and all sorts of efforts are made to improve this quality. The grindstone and whetstone are freely used.

Boys not only like to have sharp knives but they want to use them. They whittle sticks, boards, fences, palings, boxes; they cut into furniture, desks, chairs; they carve their initials upon everything which will receive them, including desks, buildings, fences, trees, walls, stones and cliffs. Pencils are sharpened often and to fine points, even when not especially dull. They also carve objects out of wood, such as canes, chairs, whistles, boats, boxes; cut out baskets and other toys from English walnuts or peach seeds. They throw their knives with open blade so that it will stick in trees, boards, or the ground. They play mumbly-peg. They often make motions with open knife in hand, brandishing it as if to stab some one. They sharpen sticks and call them daggers, or whittle out swords with which they have Indian fights, or cut down tall weeds as enemies. Stiff weeds are cut, sharpened at one end and hurled endwise at objects. Great skill is sometimes acquired in this way and the consummation of a boy's ambition is to be able to hurl one of these instruments through a pumpkin or watermelon. The sword, spear and dagger appeal strongly to the imagination of the boys. They fasten these to their belts and play robber, or soldier, and sometimes impersonate great characters like Washington, or an Indian chief, and kill imaginary enemies or charge upon wild beasts.

such as mullen stalks, stumps, grape vines, and bushes. One boy of eleven carried an old butcher-knife with him and made a spear by fastening a machine guard on the end of a broom handle, and a tomahawk by fastening a machine section on the end of a stick. Another had a sharp-pointed wire for defense, and a tin sword, which he loved to carry. These weapons are carried about or hung up in their rooms as decorations. Old swords are especially prized for this purpose, and are placed in conspicuous places. The bow and arrow are made and used with some degree of skill. The arrows are sometimes tipped with some metal point, as a nail sharpened to a fine point. These are shot at marks and sometimes at cattle, hogs, dogs and cats. Another practice which seems to give the boys an unusual degree of pleasure is to put a pin in the toe end of their shoes and prick their companions, or the cat or dog, with considerable degree of force. Sharp tools, such as the hatchet, ax, saw and chisel, are used with no definite purpose but with interest. Sharp sticks and sharp stones make a strong appeal to children, and many instances are given of collections being made of these. Sharp stones especially are picked up and saved or used for cutting or scratching, or they are thrown at a board and the effects examined. Several cases were given that might be considered as verging on the abnormal. One girl could n't look at a sharp dagger without wanting to use it on some one. Another case was that of a boy who had a mania for pricking other boys until he drew blood. The report states that he gave much trouble. One boy of 6 sharpened a stick and speared bugs and worms.

Girls are interested in the use of the scissors and love to cut designs of paper, or cut out paper dolls, or fringes in cloth or paper. Some use a sharp stick for a pencil to write their names in dirt and snow, or draw figures or forms. They also use the knife to whittle and cut their initials on trees, fences, or other places which will receive them.

The analogy between these activities of children and those of primitive man is very close. The point and edge were both tremendous factors in man's early evolution. Among nearly all primitive tribes on earth to-day the point and the edge are developed to a high degree of perfection. We must assume that there was a time when neither of these existed in any form. There must then have come a time when primitive man learned the effect of bringing his whole strength to bear upon a single point. This secret, whenever and however it was discovered, gave the favored tribe great advantage both in their quest for food and in offense and defense. Close upon this must have developed the use of the edge in some form or other; or perhaps it came before the point. At least it does

not seem illogical to associate them somewhat closely in their origin. With these weapons the tribe would be almost invincible and the cultivation of their use would become a matter of greatest moment. All through man's history they have played an ever increasing rôle. In the complex world of to-day with its myriads of inventions it is perhaps difficult to imagine that the point or the sharp edge should at one time have been the great means of survival. And yet this in all probability was the case. From this point of view it is not unlikely that those members of the tribe survived who had most skill in the use of these instruments; and that those tribes survived who were favored by these skillful individuals. In short, the use of these instruments led to somatic and psychic modifications of the race. In the story of psychic evolution some such sequence of events must have taken place, and from the point of view of the child it offers the only satisfactory explanation of this unusual interest in the instruments of this character.

The strange phobia of sharp objects with which the insane are sometimes afflicted would hint a similar origin. What in normal minds appears only as an interest is here magnified to great proportions and causes the phobia.

Whatever may be thought of the origin of this interest on the part of children in the point and edge, its use as a means of education cannot be ignored. Here again we must move with the current of the children's natural bent and allow this to decide what should be done. This factor is too often neglected in planning manual training work and other exercises for children.

#### MODIFICATION OF BODILY FORM

The facts brought out by the returns on the subject of modification of bodily form by children indicate that this is attempted to a very marked extent. Of the 245 girls and 126 boys reported upon, practically all tried to change in some way their features, or stature; or they tried to use their dress to add in some way to their effect on others. This is very largely due to a growing consciousness of self. The child very early becomes acquainted with the different parts of his head and body, but not until several years later does the sense of self assume a critical attitude. The child of two or three knows that he has a nose, eyes, mouth, ears and hair but he does not find fault with them. But at six or seven, and especially a few years later, he begins to examine his features and dress in the light of his more critical observation of the features or dress of others; or of what he has heard others consider attractive. The features and dress of persons whom the children admire

become standards with which their own are compared. There seems to be much more of a tendency on the part of girls to do this than on the part of boys.

The nose is one of the features frequently referred to and is subject to great criticism. There is, however, no definite standard of shape or size. Some think their nose too broad and pinch it constantly to reduce its width. They even put clothespins on it at night and try to sleep with the nose in this position. Others put clothespins on the nose to make it pointed. Again others want a pug nose and hold it in that position for long periods at a time. A few quotations will, perhaps, help show their attitude:

F., 20. At ten I pulled my nose so it would be pointed like my aunt's.

F., at 9. I pushed up my nose to make it shaped like a girl's I admired.

F. Pinched my nose so it would be like my teacher's.

F. Slept on my nose to keep it from being hook billed.

F. Nose turned up, wanted it to turn down. Thought of cutting off end, it was too long.

Dimples are another element of beauty, the absence of which is lamented. Several rather strenuous efforts to secure these were reported. One girl stood before the mirror for hours and pressed her fingers into her cheeks in the hope that dimples would remain. Another put clasps, which her brother used on his trousers when riding a wheel, on her cheeks. Still another made faces before the mirror to induce them to appear.

The ears also receive their share of attention. The majority of those who mentioned their ears wanted them pierced so as to wear rings in them. Some begged to have this done; others tried to do it themselves. One group of girls retired to a secret place to attempt this but their courage failed. All sorts of substitutes are made for ear rings, such as fastening strings with something attached to their ears or sticking maple seeds on their ears. One girl of 13 pulled the lobes of her ears so they would become longer. Although boys do not pay much attention to the shape of nose they are somewhat concerned about their ears. One boy of 11 wore nightcap to train his ears back; another of 12 tied a towel around his head to keep his ears from growing too large.

The eyebrows and eyelashes are considerably mutilated and for various reasons. Some children pull them out entirely, or burn them off to see how they will look without them. This is especially true with boys. Others do so to wish with them. Sometimes they are trimmed in the hope that they will grow, or because they seem too long. They are also colored or pencilled, one girl of ten putting shinola on hers.

The hair is perhaps subject to modification more than any of the other parts of the head. The scissors are freely used by both boys and girls, and they cut their own hair even at four or five years of age. They cut their curls off because they are tired of them, to see how they will look, to improve their looks, and one little girl cut hers off thinking she would then be a boy. A number of girls wanted curly hair and resorted to many means of accomplishing this, such as soaking it in buttermilk or sour milk, putting mucilage in it, or fastening shavings in it. The color of the hair also causes some anxiety and attempts are made to change its color. One girl of 10 who had red hair and freckles exhausted all her remedies in trying to change the one and remove the other. The manner of wearing the hair is also considered of some importance among children, especially girls. Some braid long ribbons into their hair to make it look longer; others put it up on top of their heads to look taller and older. One girl of 9 took great pleasure in wearing her hair in various ways, changing it frequently.

The complexion of the face is changed in many ways. Girls from 8 to 14 paint their face to improve their appearance, and give especial attention to the cheeks and lips, and use starch, water colors, young oak leaves, mullen, snow, candy and pink chalk. The mullen and snow are used to rub the cheeks briskly. Boys also color their faces, but usually for purposes of disguising themselves; or to play Indian, or impersonate some character. Girls also color their faces for purposes of impersonation. They not only color their faces but dress up in all sorts of ways. The dramatic instinct is strong and expresses itself in many ways, as will be noticed by the following quotations:

F., 9, dressed like my grown sister, powdered face.

F., 8, dressed up, using long skirt, high hat, put hair on top of head with ribbons.

M., 11, dressed in Indian costume, hat-band with feathers, belt with daggers, cheeks painted red, black lines under eyes and on forehead.

M., 10, blackened face and put old clothes on to scare sister.

There is also a marked tendency on the part of both boys and girls to impress initials, pictures, or marks of various kinds upon their hands, arms and face. An indelible pencil may be used or tattooing may be done with pin and ink. Pictures are transferred to the arms or hands and care is taken that these pictures, marks, or initials are not washed off for a long time. They are marks of distinction, and great pride is taken in showing them. This is especially true of boys who

have figures, stars, or anchors, tattooed on their arms. The finger nails are painted, pointed and notched in peculiar ways, and a favored nail may be allowed to grow long and be protected with considerable care. The girls are sometimes solicitous about the size of their hands and the shape of their fingers, and they are squeezed to make them small and of proper shape. This attitude is sometimes taken towards their whole body. One girl lamented her small stature and asked to be lifted by the head, while another sat much because she thought it would prevent her from growing tall.

It seems hardly necessary here to mention the analogy between these activities on the part of children and those of primitive man. There is perhaps not a single trait here mentioned that could not also be found among savages. The awakening of the sense of self in primitive man through long ages, is probably duplicated in a somewhat telescopic fashion by each child.

The one thing which such a study as this reveals is that children have their own point of view, many times radically different from that of the adult. One must first try to understand children and get their point of view if one is to treat them sympathetically and be helpful to them. Pedagogy sins more just at this point than perhaps in any other way. Many a parent may love his child and want to do all that is necessary for its welfare and yet utterly fail because of this inability to see things from the point of view of the child's psychic evolution. The same might be said of teachers.

#### ATTITUDE TOWARDS CLOTHING

From the returns, one must conclude that Whittier's "Barefoot boy with cheek of tan," tells only half the story, and that the barefoot girl with cheeks of tan is also to be found. Of the 350 children reported upon almost two-thirds were girls, and there was not any less enthusiasm among them for going barefoot than among the boys. From about four or five to 12, and even later, the desire to go barefoot seems to be universal among both boys and girls, although they are not all allowed to do so. This feeling is strongest in the spring when the days begin to turn warm, and just after a rain. The first hint of warm weather seems to awaken the desire to go barefoot, and in many cases parents can scarcely induce their children to wait until the days are warm enough. One boy of 12 wants to go barefoot in spring as soon as frogs croak. All sort of excuses are made by the children to accomplish this end. Some go away from home and indulge in this for a few minutes when parents do not know it. Others take off their stockings and put their shoes back on. Those children who

live in the city and are not allowed to go barefoot but who have relatives in the country, where they are permitted to do so, regard this as of sufficient reason to visit these relatives in the spring and summer. A number of teachers reported that in the spring when the days begin to be warm, every child in school would often be found with his or her shoes off at noon, and would run about in greatest glee. Several reports were given of boys taking off their shoes in winter and running about in snow for a short time. The desire to run about in the mud and wet grass with bare feet becomes very acute after a hard rain. Children say that the mud feels so pleasant, and the cool, wet grass makes their feet feel comfortable. Boys like to go bathing, or swimming as they call it, and run about on the sand in their bare feet. Others like to strip off clothing and run about in the rain. Small children seem to take special delight in running about after their bath.

The desire to go without a hat or bonnet seems to be almost as strong as the desire to go barefoot. Many cases were reported of both boys and girls going bareheaded all summer and until late in the autumn. Even when parents were solicitous about their complexion and tried to induce them to wear sunbonnets they refused to do so. F., up to 9, resented sunbonnet which mother tried to compel her to wear. M., 7, quarreled with his mother for weeks because she tried to induce him to wear a sunbonnet or large hat. He preferred to go bareheaded. F., 6, M., 8, never wear hats. These citations could be indefinitely extended.

This attitude on the part of children is strikingly analogous to that of primitive man; and it is difficult to explain on any other ground than that of atavism. It seems to be another evidence of recapitulation on the part of the child.

#### STRIKING

The striking propensity of children from infancy up to the age of 12 to 14 is so universal that it has impressed itself upon all who have even casually observed children. It has often been termed the age of striking and all through child literature appeal is made to it. The pounding of the small child upon the plate, table, chair or floor is proverbial. A boy with stick for sword and a mullen stock or flock of geese as enemy we have come to associate together. It would have been strange, therefore, if the returns had not borne out this idea that is so common concerning children. Ninety per cent. of the answers to the question concerning this phase of child activity confirmed the above prevailing notion. The infant is handed a spoon or toy and at once it begins to swing it about. The grasp is firm and can easily hold the object; finally it strikes

the table or plate; this is repeated over and over until the association is formed and then the striking becomes continuous for long periods at a time. Numbers of instances were given of this continued repetition of one act. The returns indicate that this begins not later than the sixth month. This striking by infants of table, chair, plates and the floor with toys, spoons, knives, forks, blocks was mentioned in practically all the returns. Soon the stick comes into use. Those who suffer most from this are toys, the cat, the dog, other children and adults. This tendency increases, especially with boys, from 5 to 10. Whips are made from straps and sticks or are cut from bushes and carried by the boys who constantly strike at everything that comes within reach as the following quotations will show: M., 7, carried club, stick, or cane for gun. Loved to play school and be teacher so he could whip. M., 7, struck trees and fences as "Jack the Giant Killer." Played policeman and carried club. Boys of 8 lined up with sticks and then charged upon weeds and bushes. M., 9, liked to play horse with whip and use it. Liked to hit weeds, stalks and stems. Boys of 9 struck cat, dog, trees and house with stick. M., 8, hit himself with whip as horse. M., 10, likes to cut tops of grass off with stick. Similar statements were repeated over and over in the returns. Many of the boys and girls say they carry a stick because they feel safer when walking along the street or road. In walking along with a stick it may be used to strike at weeds, animals or even people. It is also dragged along a picket fence so as to make a rhythmic noise. In riding in a vehicle one great pleasure is to use the whip on the horses. Boys and even girls engage in whipping contests, in which two of them with whip in hand beat each other until one or the other gives up. Driving stock also gives great pleasure because the whip can be freely used. Much damage is sometimes done in striking flowers, small trees and other plants of value. There seems to be an almost blind impulse to perform this motion with something in the hand in the shape of a stick or whip.

From the use of the stick and whip the child in the course of time learns the use of the lever. This usually does not occur until the tenth or twelfth year. There is considerable variation here. It is interesting that many children do discover this incidentally in their play with the stick.

Throwing probably develops in the child from striking. In his effort to strike, the object in his hand may slip from his grasp and fall to the floor. In the course of several repetitions of this the child learns to drop things on the floor and from this develops the idea of throwing. The motion is at first awkward and is little more than an aimless motion of the

arm and hand even up to the third or fourth year. Progress is slow; but gradually through constant practice and continued repetition such as only a child can engage in, the arm and shoulder muscles come under control and the act of throwing becomes more definite and purposeful. This instinct to throw grows with the child. The returns show that from about the first year up to the 12th year the interest grows and is at its height at about 13, although in some cases it goes beyond that. There was unanimous testimony on this propensity of the child for throwing. First girls and boys both throw with almost equal interest but in girls it begins to decline very soon. Small children throw everything they can get hold of: blocks, toys, spoons, knives, forks, food, balls, etc. When larger they throw stones, skippers, snowballs, water soakers, apple stealers, corncobs, and pieces of coal. Stones are used far more than any other object in throwing. The returns show that they throw at trees, street lamps, birds, boys, horses, wagons, people, windows, church steeples, signs on street, shutters, passing trains, brass balls on top of poles, cats, dogs, fruit in trees, chickens, and barns. About 40% of the boys threw at cats, dogs and birds. One of the returns gives an account of a boy with a stone in his hand slipping up to a pigeon walking about in the street and throwing at it. He struck the pigeon on its leg and broke it, and as the pigeon flew the leg dangled in the air; as the boy saw this he shouted with delight. Animal targets seem to give more pleasure than inanimate ones. This is especially true when snowballs are used. Great numbers of instances were given of boys hitting adults with balls. One lady indignantly remarked that the boys had become a nuisance and that she could not pass along the street without being pelted with snowballs. There were several accounts given of boys who used stones to fight with each other with more or less serious effects. The sling shot was mentioned at least 100 times, as a means of throwing stones. It could not be ascertained whether the boys ever invented one or not but that it appeals very strongly to the boys is quite clear.

Throwing contests are frequent and distance and accuracy are both aimed at. Throwing across a river, over a tree or building, or at some distant object tests the force of the effort. Various objects are used to test the accuracy of the throwing. There are also a great variety of games with the ball which involve throwing. These appeal greatly to boys, and as we know may develop into a permanent interest and lead to continued practice all through youth and young manhood.

The striking and throwing instinct and tendency of the child is out of all proportion to that which it would be if

it were a mere matter of imitation. Thus we must go to the early development of man for a key to the problem. Both striking and throwing involve mainly the racially old and fundamental muscles of the shoulder, arm and trunk. Both must have developed early in the life of man.

After our ancestors had descended from their arboreal life and took their erect position on the ground they had the use of their upper limbs for purposes other than those of locomotion. This enabled them to devote their hands to use in their quest for food and also more directly for purposes of attack and defense. The life in the trees had already developed the hand to some extent, and now the use of the hand and arm were constantly brought to bear in the daily life of the individual. With the free use of the hand it is not surprising that in the course of time our ancestors should have come to hold a stick in their hands, and, by swinging it, strike it against the earth or some other solid object much as an infant would do under similar circumstances. As in the case of the infant this might have to be repeated a number of times before its full significance dawned upon the individual. If, as Lotze says, we instinctively project our sense of self to the end of whatever we handle, such as a stick or other object, it can readily be seen how this primitive being would come to have a sense of increased length of arm. The force and effectiveness of the blows which he could deliver would also be very evident to him. The advantage of the use of such a stick or club was almost incalculable to the user in the struggle for supremacy with animals and perhaps other persons of his or other tribes who had not yet learned the use of this weapon. It might even be compared to gunpowder as a means of conquest and civilization. It insured food with greater ease and therefore gave leisure to fight. This emboldened the tribe with this advantage, to enlarge its domain and seek new regions for food. This led to new dangers from wild beasts and other foes and so put the favored tribe to greater and greater tests, and thus weeded out those less gifted in the use of the new instrument of warfare and left those most skilled in its use. In this way through the process of selection and the survival of the fittest the good strikers remained and handed their inheritance to after generations. The ages that must have elapsed while even such a simple thing as the use of a stick or club evolved to a high degree of perfection, must have been long; thus this power could easily become a real means of selecting those who were best fitted by virtue of bone, muscle, and brain centres to survive, and of weeding out those not so well adapted to this means of offense and defense. Again, some genius of the tribe may have modified and im-

proved the original club, and as the generations went by there were evolved all primitive means of striking, such as the ax, the hammer for crushing food, grains, nuts; the sword and other "instruments of warfare, industry and even sport."

That this long process of evolution, extending over a great period of time, should have left its stamp upon the soma and psyche of the race and thus upon modern childhood and early youth can hardly be doubted. We thus have at least a tentative explanation of this impulse of the child to strike anything and everything with such satisfaction, and of the youth who is never so happy as when he has a stick or whip in his hand striking real or imaginary objects.

As it was with striking so was it with throwing. There seems to be little doubt that this developed in the race as it does in the individual, namely from striking. In either case the only thing necessary to lead from striking to throwing would be that the instrument used for striking should accidentally leave the hand of the user while in the act of striking. Again, as in the case of the child, this might not teach its lesson the first time. But finally it would force itself upon the notice of the user and the force with which it would leave his hand and strike some object would finally be grasped. Here would be revealed the new power of bringing about results at some distance from the person throwing.

This again must have given new power for conquest that we can hardly overestimate. Here, again, perfection of the art meant new conquests, new dangers, and the application of the law of the survival of the fittest, and the handing down of this inheritance to after generations. Thus the tendency of the child to-day to throw balls, stones, snowballs, apples and anything else that he can get hold of, has its origin in these past ancestral experiences. The lovers of base ball may even be indulging in and expressing ancestral echoes.

It is a pretty well-established fact "That the fixedness of a tendency is roughly proportional to the length of time during which it has characterized the race." (Tyler, in the "Man in the Light of Evolution," p. 139.) The slow progress which our ancestors made gave this tendency an abundant opportunity to become deeply engraved upon the brain centres. This is illustrated in the animal world by "The shepherd dog and the bird dog brought up in the house apart from sheep and birds, who went the one after sheep and the other after birds as soon as turned loose in the fields. The stimulus of the appropriate object was all that was necessary to arouse the slumbering inherited instinct in the brain." (Tyler, in the "Man in the Light of Evolution," p. 137.)

The value of this point of view in its bearing upon educa-

tion is evident and has been frequently emphasized in recent years. What is needed most of all to-day in the educational world is a proper perspective of child development. Biology has given us a pretty definite outline of the evolution of the body in that it has discovered the different stages of growth through which it passes, from conception to maturity. This needs to be applied to the psyche and clothed with flesh and blood and made a living, breathing reality; for the psyche, too, has these stages which express themselves spontaneously if given an opportunity to do so. Tyler says, "The interests of the child are as truly symptoms of the attainment of a certain stage of development and real needs as the craving of the legs for exercise or hunger of the body for food," and if the stages of the soma and psyche are not given an opportunity to have their normal course they are likely to become the source of imperfections in adult life. We must come into phylogenetic rapport with the child if we are to undertake to guide his physical and mental growth successfully. It is becoming more and more clear as the child study material accumulates that the child has feelings, motives, instincts and interests that should guide the educator in his work rather than that the educator should undertake to direct and modify the child's development. The child must be allowed to evolve naturally and in harmony with its racial inheritance. But in the school work of to-day the social inheritance of comparatively recent times continues to be imposed upon the child and the deeper impulses of its soul are scarcely touched.

The composite picture of the children's activities given above tend to be misleading so far as the individual child is concerned. Perhaps no single child actually engaged in all these activities. But it is just as true that every child has more or less marked dormant impulses to do all these things, and would do them, if the environment were such as to encourage their expression. Here, then, is the great and crying need of the child. It is needless to say that there are hundreds of other vague instincts, motives, and interests in the child's soul besides those above referred to. The full and complete expression of these would give every child a richness of mind that would characterize it all through life and enlarge its sphere of interests to an extent hardly dreamed of now.

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